

SPECIAL SPECIFICATION

SECTION 02955S

LANDSCAPE

TREES, PLANTS & GROUND COVER

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CONSTRUCTION SPECIAL SPECIFICATION

SECTION 02955S

LANDSCAPE

TREES, PLANTS & GROUNDCOVER

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Under this section includes but is not limited to, the replacement planting of trees, shrubs, and ground covers, back filling, filter fabric installation, mulching of grounds and other materials necessary to accomplish finished construction as indicated in on Contract Drawings. In the event that discrepancies occur between information listed in the bid document and that listed on the Contract Drawings, the information indicated on the Contract Drawings shall govern.
- B. This section covers the requirements for materials, and services required for complete installation of plant material and related landscape items as indicated on the Contract Drawings and/or specified herein.
- C. Substitution: Plant material substitutions shall not be made without the approval of the SDR. The use of material differing in kind, quality or size from that specified will be allowed only after the SDR is convinced that all means of obtaining the specified materials have been exhausted.
- D. Sustainable Site Design: The use of xeriscape principles to promote the use of native, well-adapted plant material is encouraged. This practice reduces maintenance and irrigation requirements. Plants that are drought tolerant require watering until establishment and after, water can be drastically reduced except in periods of sever drought.
- E. Conservation and protection of natural resources at the site is important. Any disturbance of material resources occurring during planting operations shall be kept to a minimum.
- F. Plant Names: The scientific and common plant names as indicated on the Contract Drawings are generally in conformity with the approved names given in the Standardized Plant Names (SPN), 1980 Edition. The names of varieties not included therein are generally in conformity with the names accepted in the nursery trade.

- G. Related Sections: Refer to the following sections for related work: Paving, Hardscape, Planting, Seeding, Drip Irrigation, and Division 1 Specifications.
- H. Miscellaneous: Care shall be taken by the contractor to avoid driving, parking, or storing equipment and materials within the drip line of trees.
 - 1. Planting of replacement plants shall be per SNL Standard detail drawing LP5001001STD.DGN [DRAFT].

1.02 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic design only.
 - 1. AMERICAN NURSERY AND LANDSCAPE ASSOCIATION (ANLA)
 - 2. ANLA ANSI/ANLA 260.1 (1996) American Standard for Nursery Stock
 - 3. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
 - 4. ANSI A300 (1995) Tree Care Operations – Trees, Shrubs and other Woody Plant Maintenance
 - 5. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
 - 6. ASTM D4972 (1995) pH of Soils
 - 7. ASTM D5268 (1992; R1996) Topsoil Used for Landscaping Purposes
 - 8. NATIONAL ARBORIST ASSOCIATION (NAA)
 - 9. STANDARDIZED PLANT NAMES – SPN (1980 Edition) The American Joint Committee on Horticultural Nomenclature.

1.03 DEFINITIONS

- A. Borrow: Soil material obtained off-site when sufficient approved soil material is not available from excavations.
- B. Excavation: The removal of material encountered to sub-grade elevations and the reuse or disposal of material removed.
- C. Structures: Building, footing, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.

- D. Sub-grade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below sub-base, drainage fill, or topsoil material.
- E. Sustainable: Designing, constructing, and operating facilities in an efficient and environmentally sound manner through an integrated whole building design approach. The U. S. Green Building Council's Leadership in Energy and Environmental Design [LEEDTM], Rating System, version 2.1, (<http://www.usgbc.org>) and the Whole Building Design Guide (<http://www.wbdg.org>) are tools to ensure that sustainable elements are incorporated into the facility design.
- F. Unauthorized Excavation: Removing materials beyond indicated sub-grade elevations or dimensions without direction by the Sandia Delegated Representative (SDR).
- G. Utilities: On site underground pipes, conduits, ducts, and cables, as well as underground services within building lines
- H. Sub-base Course: The layer placed between the sub-grade and base course in a paving system or the layer placed between the sub-grade and surface of a pavement or walk.
- I. Base Course: The layer placed between the sub-base and surface pavement in a paving system.

1.04 SUBMITTALS

- A. General: Submit the following items in accordance with Conditions of the Contract and Section 01300 – Submittal Procedures.
- B. Product Data: Submit product data for the following materials and items. Include laboratory test reports and other data to show compliance with specifications (including specified standards).
 - 1. Anti-desiccant
 - 2. Tree Wrap
 - 3. Steel Edging
 - 4. Bark Mulch: Samples - Submit one cubic foot of bark mulch prior to placing order.
 - 5. Pecan Shell Mulch: Samples - Submit one cubic foot of Pecan Shell mulch prior to placing order.

- 6. Planting Schedule: Scheduled planting dates for each type of work to be performed.
- C. Maintenance Instruction: Submit instructions and recommendations for properly maintaining all plant material for the first growing season of landscape work. Include fertilization (types), schedules and pruning.
- D. Certification: Submit certificates of inspection or manufacturer's certified analysis at testing compliance with specifications for the following.
 - 1. Plant Materials
- E. Samples: If bark mulch or pecan shells are required, submit 1 cubic foot of mulch for approval prior to ordering material.
- F. Record drawings noting any variations from the Contract Documents. Submit two copies of record "As-Built" prints prior to expiration of the required maintenance period.

1.05 QUALITY ASSURANCE

A. Contractor Qualifications

- 1. A single firm specializing in all aspects of landscape and irrigation work and experienced with the type and scale of work required and having equipment and personnel adequate to perform the work satisfactorily.

B. Plant Materials Quality Control

- 1. Ship landscape materials with certificates of inspection required by industry and the governing authorities.
- 2. Label each tree, shrub and ground cover with securely attached waterproof tags, bearing legible designation of botanical and common name. Comply with regulation applicable to landscape materials.
- 3. Package standard products with manufacturer's certified analysis. For other materials, provide analysis by a recognized testing laboratory made in accordance with methods established by the Association of Official Agricultural Chemists, wherever applicable.
- 4. Do not make substitutions. If specified material is not available, submit proposal for use of substitute material.
- 5. Furnish plants conforming to varieties and sizes specified in the Contract Document plant list and true to botanical name as listed in the SPN, and in accordance with the ASNS.

6. Furnish healthy, vigorous, planting stock free from disease, insects and insects eggs, defects or disfigurement, bark abrasion, and sunscald damage. Plants shall be typical of their species or variety.
 7. Provide plants grown under climatic conditions similar to this (project) locale. Unless otherwise stated, all plants except native pines shall be nursery grown and shall be appropriately tagged.
 8. Container grown plant materials shall have been grown in its delivery container for not less than six [6] months, but not more than two [2] years. Root-bound plant material will not be accepted.
 9. Balled and burlapped plant materials shall have a solid ball of earth of minimum specified size and held in place securely by burlap and a stout twine or rope. Broken or loose balls will not be accepted. Protect rootball from desiccation with plastic wrap. Avoid trees with girdled roots.
 10. All trees shall have a single trunk or stem that is straight (unless otherwise specified) and free of doglegs, crooks, y-crotches or any other disfiguring shapes. All trees shall have a single central leader that shall not have been pruned.
 11. All trees shall have a branching pattern that is uniform in shape around their entire circumference.
 12. All shade trees shall be 2 ½" caliper or larger. All ornamental trees (flowering pears, plums, etc.) shall be 2" caliper or larger.
- C. Analysis and Standards:
1. Provide standard packaged products with manufacturer's certified analysis.
 2. For other materials, provide analysis in accordance with methods established by the Association of Official Agricultural Chemists.
- D. Observation: The SDR reserves the right to examine all plant materials either at the place of growth, or at the site prior to planting, to assure compliance with specifications for name, variety, size, and quality. Such examination does not preclude the right to reject materials at the project site due to damage in transit. The SDR shall have the option to select and tag any or all plants at the nursery prior to delivery to the job site.

1.06 DELIVERY, STORAGE, & HANDLING

A. Delivery

1. Notify the SDR of plant material arrival on site to accommodate immediate examination.
2. Plants "tree spaded" from nursery are acceptable providing plant balls conform to specifications.
3. Do not prune trees and shrubs prior to delivery. Do not bend or bind-tie trees or shrubs in such a manner as to damage bark, break branches or destroy natural shape. If deciduous trees or shrubs are moved in full leaf, spray with anti-desiccant at nursery before moving and again two weeks after planting. Do not drop stock during delivery. Do not remove boxed or container-grown stock from containers until planting time.
4. If planting is delayed more than 6 hours after delivery, set trees and shrubs in protected area to avoid weather and mechanical damage. Keep roots moist.

B. Storage

1. Place mulch in dry storage area away from contaminants.
2. Deliver packaged materials in original unopened containers showing weight, analysis, and name of manufacturer, in conformance with state law.
3. Protect materials from deterioration and desiccation while stored at job site.
4. Plants not installed on the day of arrival at the project site shall be stored and protected as follows.
 - a. All plants stored on the project site shall be protected from drying at all times by covering the balls or roots with moist sawdust, wood chips, shredded bark, peat moss, or other similar materials. All plants shall be watered as necessary until planting.
 - b. Plants shall be stored in areas designated or approved by the SDR.

C. Handling

1. Care shall be taken to avoid damaging plants being transported to the project site. Plants shall not be lifted by the trunk or stem, and shall not be dropped. During transportation to the site, plants shall be properly covered to prevent drying out. Damaged plants will be rejected and shall be removed from the site immediately.
2. Lift trees only by methods that will not damage bark or loosen trunk from rootball or otherwise damage the appearance, health or growth of the tree.

3. Handle shrubs and ground covers by containers; do not carry by foliage or branches. Do not drop or damage material during moving.

1.07 PROJECT-SITE CONDITIONS

A. Pre-Construction Walk-Thru

1. A Landscape Walk-Thru of the construction site shall be scheduled at the Pre-Construction kick-off meeting or the Contractor shall notify the SDR five [5] days in advance of a proposed Pre-Construction Walk-Thru date. The SDR shall be responsible for notifying Dept. 10843-3 of the scheduled walk-thru.
2. The Contractor shall assume responsibility for locating all site utility systems, including existing irrigation.
3. The entire project site and adjacent landscaped areas shall be inspected by the SDR, Contractor, and a Dept. 10843-3 Representative. All existing Landscape and irrigation conditions shall be recorded at this time. Areas that will be affected by the construction project shall be identified and responsibilities noted to include repairs and watering. The Contractor shall be responsible for any damage to adjacent landscaped areas caused by the project construction activities.
4. Irrigation Systems shall be activated to determine operating condition and sprinkler heads located and marked with a bright pink flag. Sprinkler heads not functioning properly shall be marked with a yellow flag and scheduled for repair or replacement by the Contractor [or as deemed otherwise by the SDR] with SFM. The SDR shall determine the timing of these repairs. Affected areas shall be photographed with flags in place and conditions noted in a narrative prepared by the SDR for approval by the Contractor. After existing conditions have been recorded and agreed upon, responsibilities shall be assigned by the SDR. Non-operating systems may be abandoned in place.
5. Pre-Existing Conditions: Identified and non-identified repairs in areas affected by the project construction activities shall be made by the Contractor [or as deemed otherwise by the SDR] as the project schedule permits or during the Site Restoration Phase of this effort with the Dept. 10843-3 Representative. Refer to Section 1.08.B for additional information.

1.08 CARE OF PLANT MATERIAL & IRRIGATION SYSTEM

- A. During construction/rehabilitation plant material shall be regularly irrigated.

- B. Where irrigation outages' will occur and will last longer than one week, the Contractor shall be responsible for watering landscape and plant material once per week until automatic irrigation service is restored. Apply water using the following formula:
 - 1. Five [5] gallons of water for each inch of trunk caliper [width].
 - 2. Two to five [2-5] gallons of water for shrubs and ground cover.
- C. Repairs: Where piping in lengths of 20-feet or more is to be replaced, the repaired portion to the System shall be pressure tested. This shall be accomplished by capping the end section of the newly installed repair pipe and applying 100 psi water pressure for 1-hour. All joints shall remain exposed during testing and backfilling shall be completed as specified in Section 02821-S. The SDR or a Dept. 10843-3 Representative shall be present during testing.
 - 1. Match material in-kind. Substitution permitted only by the SDR's approval. Refer to the Installation Section of Section 02821-S.

1.09 PERFORMANCE

- A. Perform work in a manner that will avoid damage if possible to existing utilities. Hand excavate as required.
- B. Proceed with and complete landscape installation as the site (or portions of) become available, working within seasonal limitations.
- C. Do not plant when conditions detrimental to plant growth [such as rubble fill, adverse drainage conditions, or obstructions] are encountered. Immediately notify the SDR if any adverse conditions are encountered.
- D. Coordinate plant locations with the location of irrigation heads. If any discrepancies are found between the two, notify the SDR immediately and do not proceed with further work in that area until notified by the SDR.
- E. Plant trees and shrubs after final grades are established and prior to planting of lawns, unless otherwise deemed acceptable by the SDR. If planting of trees and shrubs occurs after lawn work, protect lawn areas and promptly repair damage to lawns resulting from planting operations.
- F. Damage Control: Provide a Plant Protection and Preservation Plan [The Plan] for plant material in and adjacent to the Project Site that are not scheduled to be removed. The Plan shall show trunk lotions and dripline areas of all trees and significant shrubs to be preserved in and adjacent to the Project Site.
- G. Any trees or shrubs identified for demolition shall be inspected by the SDR and the Dept. 10843-3 Representative to determine transplanting feasibility.

- H. Root Cutting: The Contractor shall seek the approval of the SDR and Dept. 10843-3 Representative prior to cutting or removing any tree root 2-inches or larger.

1.10 WARRANTY

- A. All plant material shall be guaranteed to be in a live, healthy, and normal growing condition following the date of final acceptance by the SDR thru one-twelve month growing season. Plant materials that are dead or are in an unhealthy, impaired growth condition shall be removed and replaced by the Contractor at no additional cost to SNL. Replacement material shall be of equal quality, size, and species as the original and shall be approved by the SDR prior to planting. Any plants replaced after the first six months of the warranty period shall also be under warranty for six months after the replanting date.
- B. Remove and replace trees, shrubs or other plant material found to be dead or in an unhealthy condition during warranty period. Removal shall occur within ten working days after notification from SDR.
- C. Replace with plants of same size and species as specified, planted in the next growing season, with a new warranty commencing on date of replacement.
- D. Another inspection will be conducted at the end of the extended warranty, if any, to determine acceptance or rejection. Only one replacement will be required at the end of warranty period, except for losses or replacements due to failure to comply with specified requirements.

PART 2 - PRODUCTS

2.01 GROWERS AND NURSERIES

Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include but are not limited to the following:

- A. Plants of the Southwest
- B. Plant World Inc.
- C. Santa Ana Nursery
- D. Trees of Corrales
- E. Nature's Way Wholesale Nursery

2.02 PLANTING BACKFILL MIX

- A. Unless otherwise noted, backfill shall consist of clean existing soil mixed with the required soil amendments. If existing soil is determined to be unusable, provide a premixed, homogenous soil consisting of native soil, organic matter, soil amendments, and fertilizers.

2.03 PLANT MATERIALS

- A. Provide sound, healthy specimens typical of their species, with well-formed tops and good healthy root systems. Provide materials free from injurious pests, diseases, broken branches and objectionable disfigurements. Provide nursery grown plant materials except for native pines.
- B. Plant List: The Contractor shall furnish and plant all plants shown on the Contract Drawings, as specified, and in quantities listed on the plant material list. If discrepancies exist between the count of plant materials as shown on Contract Drawings, and as listed on the plant material list, the actual count of the Contract Drawings shall be considered correct.
- C. All plant material shall be nursery-grown stock [except for native pines] conforming to ANLA ANSI/ANLA Z60.1. All plants shall conform to the species, variety, condition, and sizes specified in the plant material list. Substitutions shall be allowed only where alternate plant materials are specified on the Contract Drawings, or as approved by the SDR.
- D. Strictly adhere to the American Standard for Nursery Stock unless specific approval is given for particular plant material, which does not meet those specifications.
- E. Nomenclature: Conform to Standardized Plant Names and accepted botanical nomenclature in the nursery trade.
- F. Furnish plant material graded in accordance with the code of standards of the NAA. Provide plant sizes at least equal to the minimum size indicated. Remove undergrade plants and replace prior to provisional acceptance.
- G. To ensure whole sound condition of the rootball, fully wrap the balled and burlapped material with sound [no deterioration] wrapping fabric. Properly root prune balled and burlapped stock when dug and during cultivation.
- H. Ensure container stocks have been grown in its delivery container for not less than six months. Any root bound plant material will not be accepted.

- I. Trim specimen trees over 2-inch caliper after planting to a maximum of one-third total branch length or quantity. Trees and shrubs shall be pruned and repairable.

Injuries made as follows:

1. Flush cuts are unacceptable. A proper cut shall begin just outside the branch bark ridge and angles down away from the stem of the tree, avoiding injury to the branch collar.
2. Comply with ANSI A300, "Trees, Shrubs, and Other Woody Plant Maintenance – Standard Practices."

Planting Soil Mixture: Shall be a mixture of one part back fill amendment to three parts existing soil. The backfill amendment shall be. — — — — —

1. 70% by volume, organic compost, screened to ½-inch minus, pH not to exceed 7.0.
2. 20%, by volume, 'Moisture-lite', screened to pass a #40 mesh.
3. 10%, by volume, 'Ecolite', screened to pass a #40 mesh.
4. Components shall be homogeneously mixed, in ten cubic yard batches to provide a uniform product, free from weed seeds, sticks, rocks, or other deleterious materials.
5. Backfill amendment shall be as produced by:

WESTER ORGANICS INC.
9000 Bates Rd. SE
Albuquerque, NM 87105
505.877.8670

Or approved equal.

K. Quality and Size:

1. Conform to the Grading Code of Nursery Stock No. 1 grade.
- 2. Plants shall have a growth habit that is normal for the species and shall be sound, healthy, vigorous, well-branched and well-formed, with healthy root systems, and be free from disease, sunscalds, windburn, abrasion, harmful insects or insect eggs.

3. Trees shall be symmetrically developed on all sides with reasonably straight trunks or stems (unless otherwise specified), and be free from objectionable disfigurements, y-crotches, or scars. Provide trees, deciduous and evergreen, well-shaped, full, sound, and healthy specimens with well-formed tops and healthy root systems.
4. Plants shall be equal to or exceed the measurements specified in the plant list, which are minimum acceptable sizes. They shall be measured before pruning, with branches in normal position. Requirements for measurements, branching and quality of plants in the plant list generally follow the code of standards currently recommended by the AAN, Inc., in the American Standard for Nursery Stock. Plants of the same variety used in a group or in close proximity shall be of uniform size.
5. Plants larger than specified in the plant list may be used if approved by the SDR, but use of such plants shall not increase the contract price. If use of larger plants is approved, the root shall be increased in proportion to the size of the plant (in accordance with ANSI Z60.1).
6. Container grown plants shall have sufficient root growth to hold the soil intact when removed from containers, but shall not be root bound. They shall have been grown in containers for a period of not less than six [6] months and for no more than two [2] years with the exception of larger container grown trees, character trees or specimen plants in 20 gallon or larger containers.
7. Provide ground cover plants in flats or removable containers.
8. Ground cover plant material shall be established and well-rooted, and shall have sufficient roots to hold the soil intact after removal from the pot without being "pot-bound". Plants shall have runners meeting the minimum requirements for number and length as listed in ANSI Z60.1.
9. Plant materials shall conform to the requirements and recommendations of ANSI Z60.1. All plants shall have been grown or acclimatized under climatic conditions similar to those in the locality of the project.
10. Plants shall be dug and prepared for shipment in a manner that will not cause damage to future development after planting.
11. Rootball of plant materials are to be free of weeds including but not limited to briars, bindweed, poison ivy, nutgrass and dallis grass.
12. Balled and burlapped plant material shall have a solid ball of earth of minimum specified size and held in place securely by burlap and a stout twine or rope. Broken or loose balls will be rejected.

13. Comply with federal and state laws requiring inspection for plant diseases and infestations. Inspection certificates required by law shall accompany each shipment of plants, and certificates delivered to the SDR. Before installing plants delivered from outside the country in which planted, obtain clearance from the County Agricultural Commissioner as required by law.

2.04 SOIL AMENDMENTS

- A. Fertilizer: Proportioned to eliminate any deficiencies of topsoil as follows: Nitrogen [18%], Phosphoric Acid [24%], Soluble Potash [16%].
- B. Organic material: Shredded, loose, free of lumps, roots, inorganic matter or acidic material.
- C. Bone Meal: Raw, finely ground, commercial grade, minimum of 3% nitrogen and 20% phosphorous.
- D. Water: Clean, fresh, and free of substance or matter, which could inhibit vigorous growth of plant.

2.05 MULCH

- A. Provide one or more of the following, as noted on the Contract Drawings:
 1. Crusher Fine Gravel Mulch – Color to match existing.
 2. Large Gravel Mulch – ¾ inch, color to match existing.
 3. Cobble Mulch – Stones not less than 4 – inches in any direction and not more than 12 – inches in any direction with less than 15% broken fragments.
 4. Bark Mulch - Bark mulch shall be fresh, shredded mixture of ½” – 5” pieces of wood, cambium and bark nuggets from coniferous trees, as available from Western Organics Inc.
 5. Pecan Shells – as available from Western Organics Inc.

2.06 OTHER MATERIALS

- A. Topsoil: Topsoil shall be as defined by ASTM D 5268.
 1. Suitable topsoil includes selectively excavated material that is representative of soils in local vicinity and is reasonably free from underlying sub-soils, clay lumps, objectionable weeds, litter, brush, matted roots, toxic substances or any material that might be harmful to plant growth or be a hindrance to grading, planting or maintenance operations.

2. Topsoil shall not contain more than five percent by volume, stones or other objects larger than one inch in any diameter.
 3. Imported topsoil shall comply with the following:
 - a. Composition (by volume)
 - (1) Organic material – minimum of 2%.
 - (2) Silt – minimum of 15%.
 - (3) Sand – 15 to 50%.
 - (4) Clay – 15 to 35%.
 - (5) Foreign Materials – maximum of 1.0%.
 - (6) Top soil shall be approve by the SDR prior to installation.
 - b. Soil pH shall be suitable for specified plants and be tested in accordance with ASTM D 4972. Typical pH range shall be pH 5.5 - 8.5.
 4. Transport imported topsoil directly form the source to final location unless approved the SDR to be placed in stockpiles. If amendments are required, mix in an approved manner prior to placing on site. If stockpiling is approved, the locations and amount of the stockpiles will be designated by the SDR.
 - a. Natural Fertilizer/Soil Conditioner: Provide as supplied by the following manufacturers: Soil Foods Inc., [505.983.8078] or Technology International [505.291.1100] or an approved equal.
- B. Fertilizer:
1. Commercial fertilizer shall be delivered to the site in unopened original containers, each bearing the manufacturer's guaranteed analysis.
- C. Stone:
1. As supplied by:

Rocky Mountain Stone Co.
4741 Pan American Fwy NE
Albuquerque, NM
[505.345.8518]

Or an approved equal.

2. Paths and other open areas (shown on document drawing).
3. Mulch for planting beds.
 - a. 3/8" Sunset Rose gravel.
 - b. 3/8" Santa Fe Brown gravel.
 - c. Pecan Shells.
 - d. Bark mulch for trees – as specified in 2.05A.4.
5. Large boulder (for seating, etc.)
 - a. Los Lunas Boulder dimensions in ranges of: Length 3' – 5', width 2' – 3', and height 20" – 30".

D. Tree Wrap:

1. Trees shall be wrapped as indicated with Kraft tree wrap (or approved equal), not less than 4" wide with 50% overlap. Trunks shall be wrapped to the lowest branches. Refer to LP5001001STD – Planting Details & Schedule. Wrap trees under the following conditions:
 - a. Trees with thin bark.
 - b. Trees with a caliper 3-inches or less.
 - c. Trees that are susceptible to sun scald.
 - d. Trees planted in the eastern out-lying areas of the Campus.
 - e. Trees that are planted during the non-growing season [Nov. thru March].

E. Guying and Staking Materials:

1. Stakes, Guy, and Chafing Guard:
 - a. Provide as indicated on Standard Drawing LP5001001STD - Planting Details & Schedule.
 - b. "Three-point" method also acceptable.

F. Tree Protection:

1. 'Tree Pro' as manufactured by Tree Pro, West Lafayette, IN., 1.800.875.8071, or approved equal.

G. Filter Fabric:

1. Non-woven polypropylene or polyester [90 lbs. min.] material. ASTM D1682. Elongation percent per ASTM D1682: 65% maximum. Equivalent open (US Sieve No.): 50 – 100 Permeability coefficient (CM/SEC): 05 min. weight in pounds per sy: .09 minimum. ASTM D4491. Filter fabric shall be commercial grade.

H. Steel Edging:

1. Provide commercial steel edging 1/8-inch in thickness and 5-1/2 inches in depth.
2. Color shall be Green or Brown as specified on the Contract Drawings.
3. Provide stakes as required by manufacture.

Anti-desiccant: Emulsion-type, firm forming agent designed to permit transpiration but retard moisture loss. Deliver in manufacturer's fully identified containers and mix in accordance with manufacturer's instructions.

1. Acceptable product: "Wilt-Pruf" or approved equal.

J. Water: Water shall be suitable for irrigation and free from ingredients harmful to plant life. The Contractor will furnish required hoses and watering equipment.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine grading and existing conditions of planting locations. Planting operations shall begin only when other work including placing topsoil to finished grade has progressed sufficiently to permit planting.
- B. Planting may be done whenever the weather and soil conditions are favorable (preferably Spring thru late Fall) or as otherwise authorized by the SDR.

3.02 LAYOUT

- A. Prior to excavation, all tree and shrub locations shall be staked and marked for review by the SDR.
- B. Plant material locations shall be as shown on planting plan except where field conditions dictate adjustments. Layout edges of planting beds, stake trees, and mark shrub locations with the actual containerized plant material for review by the Sandia Grounds Team Leader – Dept 10843-3 and the project SDR.

3.03 EXCAVATION

- A. Prior to excavation of planting beds, swales and pits, all areas shall conform to the grades and slopes as shown on the drawings, and the location of any underground utilities and irrigation system shall be verified by the Contractor. Any damage to existing utilities or irrigation systems shall be immediately repaired at Contractor's expense.
- B. Rock and other debris shall be removed to a depth necessary to permit proper planting.
- C. Plant pits shall be excavated with vertical sides [110° - 135°] and shall meet the minimum dimensions shown on Standard Drawing LP5001001STD - Planting Details & Schedule.
- D. Excess soil and other excavated materials shall be removed from the project site, or as directed by the SDR.

3.04 BED PREPARATION

- A. Bed areas shall be cultivated to a depth of 6-8 inches, removing all grass, weeds, roots, rocks, and other debris.
- B. Prior to planting, water all areas thoroughly to produce weed growth. Apply "Roundup" herbicide to kill all growth and proceed with installation after period recommended by herbicide manufacturer.
- C. Incorporate native fertilizer/soil conditioner at the rate of 1 part natural fertilizer/soil conditions by 3 parts soil.

3.05 SETTING PLANTS

- A. Trees:
 - 1. Prior to excavation of planting beds and pits, all areas shall conform to the grades and slopes as shown on the Contract Drawings, and the location of any underground utilities and irrigation system shall be verified by the Contractor. Damage to utilities or irrigation system shall be immediately repaired at Contractor's expense
 - 2. Excavate tree pits to a diameter three [3] times greater than the spread of the rootball, and at the same depth of the rootball. Do not disturb soil at the bottom of the pit.

3. Remove all plastics or gro-bags from rootball. Center and set tree plumb with the full side of the plant facing the front of the bed with top of ball at or slightly higher (no more than 1-inch) than the surrounding finished grade. Remove wire basket, cut and remove any twine or rope from rootball. Fold back burlap to expose upper half of rootball.
4. Backfill and carefully tamp layers to two-thirds the depth of the rootball and flood with water. The backfill shall be watered to settle the soil and eliminate air pockets. No packing materials shall protrude above soil level after planting is completed.
5. After water is absorbed, install 6 fertilizer tablets evenly around perimeter of each tree rootball 6-inches below grade. Continue backfilling and tamping to grade, leaving no voids or air pockets. Water again after placing final layer of backfill.
6. Form a 6-foot diameter build-up saucer or a 6-foot diameter depression 4-inches below surrounding finished grade with sides neatly sloped inward to top of rootball. On slopes, maintain 4-inches below surrounding grade on the downhill side. Fill saucer or depression with 2 – 3 inches of bark or pecan shell mulch.
7. Broadcast over the root ball and backfill soil, at the recommended rate, a broad-spectrum, pre-emergent herbicide prior to mulching.
8. Trees shall be staked, guyed, wrapped (as needed), protected, and mulched as indicated on Standard Drawing LP5001001STD - Planting Details & Schedule.

B. Shrubs and Groundcover:

1. Final grades of shrub areas and final shrub layout shall be approved by the SNL Grounds Team Leader – Dept. 10843-3 and the project SDR.
2. Clear shrub areas of rocks, stones larger than 1-inch in any dimension and other debris.
3. Container grown stock shall be removed from containers in such a way as to prevent damage to plant or roots.
4. Place individual shrubs in pits a minimum of 6-inches deeper and 12-inches wider in diameter than the container or ball size. Place plants on compacted backfill layer. Shrubs shall be uniformly spaced as indicated, plumb and at finished grade, with the full side facing the front of the bed.
5. Place three fertilizer tablets per shrub when shrub pit is two-thirds backfilled. Place backfill to finish grade level and thoroughly soak.

6. All bed areas shall have rock mulch spread as indicated on Contract Drawings to a uniform thickness of 2-inches. Set top of backfill in shrub areas to allow for mulching.
7. Install "filter fabric" (weed barrier) and mulch as indicated on Contract Drawings.

C. Ground Cover and Multiple Plant Areas:

1. Loosen sub-grade of planting bed areas to a minimum depth of 6-inches. Clear area of stones larger than 1-inch in any dimension, sticks, rubbish and other extraneous matter.
2. ~~Place approximately 1/2 of total amount of planting soil required. Work into top of loosened sub-grade to create a transition layer, then place remainder of the planting soil.~~
3. Layout ground cover material and align plants uniformly. Excavate pits large enough to set each plant. Scarify root mass of each plant as deemed necessary. Backfill with excavated planting soil mix. Water thoroughly. Fill depressions and level high spots.
4. Prune ground cover plant material as deemed necessary.

- D. Apply anti-desiccant using power spray to provide an adequate film over trunks, branches, stems, twigs and foliage according to manufacturer's recommendations. If deciduous trees or shrubs are moved in full leaf, spray with anti-desiccant a nursery before moving and again two weeks after planting.

3.06 SETTING STONE

A. Mulch For Planting Beds.

1. 3/8" Santa Fe Brown 2-inches minimum depth.
2. ~~3/8" Sunset Rose gravel, 2-inches minimum depth.~~
3. Crusher Fines or 1/2" Tinaja gravel – 2-inches in depth.

B. Gravel Mulch:

1. Install gravel mulch at a depth of 2 - 4-inches max. unless otherwise indicated. All mulch shall be installed a minimum of 1-inch below surrounding hardscape grade.

C. Large Boulders For Seating, etc.:

1. Los Lunas Boulders dimensions in range of: Length 3'-5', width 2'-3', and height 20" – 30" refer to drawing.

3.07 WATERING

- A. All plant materials shall be watered until soil is saturated following planting.

3.08 PRUNING AND REPAIR

- A. Trees and shrubs shall be pruned and injuries repaired in the following manner:

1. Comply with ANSI A300, Trees, Shrubs, and Other Woody Plant Maintenance Standard Practices.
2. The amount of pruning shall be limited to the minimum necessary to remove dead, damaged, or conflicting branches.
3. Flush cuts are unacceptable. A proper cut shall begin just outside the branch bark ridge and angles down away from the stem of the tree, avoiding injury to the branch collar.
4. The typical growth habit of each plant shall be retained as much as possible.
5. All cuts larger than 3/4 inch diameter shall be trimmed back to healthy tissue, smoothed so as not to retain water. Do not bind plant with wire or rope, which might damage the bark or break branches.
6. All pruned materials shall be removed from project site.

3.9 RESTORATION AND CLEAN-UP

- A. Excess and waste material shall be removed daily. When planting has been completed in an area, clear area of all debris and containers. Clean any portion of the project site used for storing materials and equipment of all debris. Sweep or wash walks and pavement clean upon completion of work in this section.

3.10 PROTECTION OF PLANT MATERIALS

- A. Following planting operations, place warning signs and barriers as deemed necessary by the SDR to protect planting against damage of any kind.

- B. Protect landscape work and materials from damage due to landscape operations, operations by other contractors, trades and trespassers. Maintain protection during installation and maintenance periods.
- C. Repair damage resulting from erosion, gulleys, and washouts or other causes by filling with topsoil, tamping, refertilizing and resetting plants at no additional cost to Sandia.

3.11 MAINTENANCE DURING INSTALLATION

- A. Maintenance of plant material to follow ANSI A 300 Standard Practices.
- B. ~~Maintenance operations shall begin immediately after each plant is installed and shall continue for a period of thirty [30] days [minimum] following final acceptance.~~ Plants shall be kept in a healthy, growing condition by watering, pruning, spraying, weeding, and any other operations necessary to maintain such health. Planting beds shall be kept free of weeds, grass, and other undesired vegetation. Keep all walks and paved areas clean. The site is to be kept clear of debris resulting from landscape work or maintenance. Protect planted stock from damage resulting from trespass, erosion [to include watering], weather disease, and other hazards.
- C. Contractor shall be responsible for repair or replacement of any damaged structures, plants, etc. in which damage resulted from planting operations.

3.12 SUBSTANTIAL COMPLETION

- A. The SDR shall inspect all work for substantial completion upon written request by the Contractor three days in advance.
- B. Upon completion of all repairs or replacements requested at the time of inspection, the SDR shall certify in writing the substantial completion.

3.13 ~~GUARANTEE PERIOD~~

- A. All plant materials shall be guaranteed for replacement for a period of 365 days, beginning on the date of substantial completion.
- B. Replacements:
 - 1. Any plant required under this contract that is dead or not showing satisfactory growth, as determined by the SDR shall be promptly removed from the site and replaced by the Contractor within ten consecutive working days of being notified by the SDR. All replacements shall be of the same size and variety as originally specified, unless otherwise directed.

2. The Contractor will not be responsible for theft or damage to plants by vehicles or vandalism following substantial completion.

3.14 MAINTENANCE DURING GUARANTEE PERIOD

- A. The Contractor will be responsible for all maintenance of plant materials up to the date of substantial completion, and for a thirty [30] day maintenance period beginning on the date of substantial completion. During this thirty [30] day maintenance period, the Contractor is responsible for:
 1. Watering plants as necessary to maintain adequate supply of moisture in root zone.
 2. Coordination of CICS programming with the SNL Grounds Team Leader – Dept 1084-3.
 3. Watering at a rate, which allows soil to absorb water.
 4. Prune plants as required to remove dead branches.
 5. Mulch plants to keep a depth of 2 to 4 – inches.
 6. In planting beds, remove grass and weeds on a weekly basis.
 7. Spray plants with approved insecticides and fungicides as required and directed by the SDR.
 8. CICS programming adjustments.
 9. Inspect and perform maintenance on a weekly basis.

3.15 FINAL INSPECTION AND FINAL ACCEPTANCE

- A. At the end of the maintenance and guarantee period, inspection of plants will be made by the SDR upon written request by Contractor five days in advance. The Contractor will be notified in writing of the Final Acceptance, or of work required. The Contractor will be responsible for all maintenance until Final Acceptance is granted and thirty [30] days thereafter at which time Sandia will resume responsibility.
- B. Landscape work may be inspected for acceptance in phases agreeable to the SDR providing work offered for inspection is completed including maintenance. Final inspection shall be done by the Sandia Dept 10843-3 Representative and the project SDR. Existing Project-Site Conditions addressed under Sections 1.07 and 1.08 of this specification shall also be inspected at this time for final acceptance.

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- C. Any plant material, as required under this contract that is dead, not true to name or size as specified, or not in satisfactory growth condition, as determined by the SDR shall be removed from site and replaced as originally specified without cost to Sandia.

END OF SECTION